AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning at **page 111, line 9**, and insert the following rewritten paragraph:

More specifically, the change ΔMr of a floor reaction force moment horizontal component per unit acceleration in the direction of each horizontal axis (X-axis, Y-axis) in the body inclination mode corresponds to the inertial moments of horizontal axis flywheels (FHx and ~~Fhy~~FHy).

Please replace the paragraph beginning at **page 140, line 2**, and insert the following rewritten paragraph:

If the coefficient of friction between the floor and the foot 22 is denoted by μ, and an effective radius of the surface of contact between the floor and the foot 22 to generate a moment vertical component (or a square root of a sectional secondary moment about a desired ZMP of the surface of contact between the floor and the foot 22) is denote by r, then Mzmin must be always set to be not less than $-\mu * r *$ floor reaction force vertical component, and Mzmax must be set to be not more than $\mu * r *$ floor reaction force vertical component. A simplest setting method is to set according to the following expression, in which ka is a positive constant that is smaller than 1.

~~Mzxmin~~ Mzmin = $-ka * \mu * r *$ Floor reaction force vertical component

Mzmax = $ka * \mu * r *$ Floor reaction force vertical component

Please replace the paragraph beginning at **page 181, line 17**, and insert the following rewritten paragraph:

Then, the initial body posture angular velocities of Equations 37a and 37b and the heights of the trapezoids of ZMPrec (the trapezoidal patterns shown in Fig. 30) related to the integration of the second terms of the right sides of Equations 37a and 37b are taken as unknown numbers (However, the times of the break points of the trapezoidal patterns of ZMPrec are determined beforehand. Further, a trapezoidal height acyc1 of ZMPrec of a first turning gait and a trapezoidal height acyc2 of ZMPrec of a second turning gait are set to have the same value.) An initial body posture angular velocity determined by solving the simultaneous equation of Equations 37a and 37b including the unknown numbers is decided as a new initial body posture angular velocity. In this case, the terminal body posture angular velocity in Equation 37b is obtained by coordinate-converting the initial body posture angular velocity, which is an unknown number, into a value observed from a next time's gait supporting leg coordinate system by a matrix based on the above total turning angle of a normal gait.

Please replace the paragraph beginning at **page 202, line 5**, and insert the following rewritten paragraph:

Then, the initial total center-of-gravity vertical position and velocity of the

normal gait determined as described above is substituted into the terminal total center-of-gravity vertical positions and velocities of the following equations 41a and 41b, and the total center-of-gravity vertical position and velocity of the last time's desired gait instantaneous value (to be more precise, the value obtained by converting the terminal state of the last time's desired gait into the current time's gait supporting leg coordinate system) into the initial total center-of-gravity vertical positions and velocities of Equations 41a and 41b. A floor reaction force vertical component pattern (to be more specific, a parameter value) of the current time gait is determined such that the relationship between Equations 41a and 41b is satisfied. The integrated values in Equations 41a and 41b are to be the integrated values in the period from the start to the end of the current time gait.

Please replace the paragraph beginning at **page 207, line 20**, and insert the following rewritten paragraph:

The explanation will now be given. In S800, various elements are initialized. Specifically, zero is substituted into time k for generating a provisional gait. Furthermore, the initial state of the current time gait is obtained by converting the terminal state of the last time's desired gait (to be more specific, the end values of the gait states, including a horizontal body position and velocity, a vertical body position and velocity, a body posture angle and its angular velocity, a desired foot position/posture, and a desired arm posture) into a current time's gait supporting leg coordinate system.

Please replace the paragraph beginning at **page 289, line 11**, and insert the following rewritten paragraph:

In this Fig. 60, the same processing as that from S010 to S028 of the main flowchart (Fig. 13) of the aforesaid reference example is carried out from S2010 to S2028. In the initialization in S800 of the flowchart of Fig. 43 that is the subroutine of S028 (S2028 in the present embodiment), the initial state of a current time gait is obtained by converting the terminal state of the last time's corrected gait (the final gait that the gait generator 100 outputs) into a current time's <u>gait</u> supporting leg coordinate system. The terminal state of the original gait determined in S2032, which will be discussed hereinafter, is not used in S800 of the subroutine of S2028.

Please replace the paragraph beginning at **page 296, line 10**, and insert the following rewritten paragraph:

Subsequently, the processing proceeds to S2210 wherein, based on the difference in antiphase arm swing angle between models, a required value Mafdmd of the floor reaction force moment for stabilizing a model antiphase arm swing angle that is necessary for converging the difference to zero is determined. If the floor reaction force moment for generating an antiphase arm swing angular acceleration of the antiphase arm swing mode of the corrected gait is merely balanced with the floor reaction force moment for generating an antiphase arm swing angular acceleration of the antiphase arm swing mode of the original gait, then the <u>difference</u>

in antiphase arm swing angle between models does not converge to zero. The required value Mafdmd of the floor reaction force moment for stabilizing a model antiphase arm swing angle has a meaning as a moment resulting from subtracting the floor reaction force moment for generating the antiphase arm swing angular acceleration of the antiphase arm swing mode of the original gait from the floor reaction force moment generated when a motion is made to return the antiphase arm swing angle of the corrected gait to the antiphase arm swing angle of the original gait by an antiphase arm swing mode.

Please replace the paragraph beginning at **page 307, line 13**, and insert the following rewritten paragraph:

Subsequently, the processing proceeds to S2218 wherein a desired floor reaction force moment vertical component for compliance control is determined according to the equation shown in the figure. The floor reaction force moment vertical component that balances with the corrected gait in the equation shown in the figure (dynamically balances with the motion of the corrected gait) is the sum of a floor reaction force moment vertical component without correction and a model antiphase arm swing stabilization floor reaction force moment. Alternatively, however, the floor reaction force moment vertical component about a desired ZMP may be directly calculated on the basis of a current time instantaneous value of the motion of a finally determined corrected gait.

Please replace the paragraph beginning at **page 315, line 13**, and insert the

following rewritten paragraph:

As an alternative construction, the simplified model 100c1 may not be included in the full-model correction unit ~~100c2~~ 100c. The full model 100c2 includes either an inverse full model (an inverse dynamic full model) or a forward full model (a forward dynamic full model), as will be discussed hereinafter.

Please replace the paragraph beginning at **page 339, line 14**, and insert the following rewritten paragraph:

In other words, the antiphase arm swing angle correcting perturbation model 231 is represented by equation a23c. The perturbation model floor reaction force horizontal component for correcting antiphase arm swing angle ~~Fr~~ Fa is determined according to Equation a21c as described above (Fa = 0).

Please replace the paragraph beginning at **page 370, line 17**, and insert the following rewritten paragraph:

Meanwhile, the corrected desired floor reaction force moment vertical component with restriction ~~Mltd~~ Mltdz is output as the desired floor reaction force moment vertical component for compliance control about a desired ZMP.

Please replace the paragraph beginning at **page 370, line 21**, and insert the following rewritten paragraph:

More specifically, according to the following Equation ~~h35~~h36, a corrected desired floor reaction force moment vertical component about the desired ZMP is determined as the final desired instantaneous value of the floor reaction force moment vertical component (the moment vertical component about the desired ZMP), these are output.

Please replace the paragraph beginning at **page 391, line 20**, and insert the following rewritten paragraph:

Further, in the present embodiment, an antiphase arm swing angle ~~moment~~ correcting perturbation model moment Ma is determined in the antiphase arm swing angle correcting perturbation model moment determiner 230.

Please replace the paragraph beginning at **page 392, line 13**, and insert the following rewritten paragraph:

Subsequently, in a calculator 230g, a corrected desired floor reaction force moment vertical component without restriction Minz is determined by subtracting the last time value (an output of an integrator, which will be discussed later) of the antiphase arm swing angle correcting perturbation model moment Ma from the sum of the full-model floor reaction force moment vertical component Mfullz, the compensating total floor reaction force moment vertical component Mdmdz, and the required value Mafdmd of antiphase arm swing angle correcting perturbation model

stabilization moment. Then, in a restricting means (restriction processing unit) 230h, a restriction is added to the corrected desired floor reaction force moment vertical component without restriction Minz so that it does not exceed a floor reaction force vertical component moment permissible range (that is, passing it through a shown saturation characteristic function), thereby determining the corrected desired floor reaction force moment vertical component with restriction Mltdz. Next, the value obtained by subtracting the sum of the full-model floor reaction force moment vertical component Mfullz, the compensating total floor reaction force moment vertical component Mdmdz, and the required value Mafdmd of antiphase arm swing angle correcting perturbation model stabilization moment from the corrected desired floor reaction force moment vertical component with restriction Mltdz is integrated by an integrator 230i using an integration gain Ka so as to determine the antiphase arm swing correcting perturbation model moment Ma, which is output. In addition, the corrected desired floor reaction force moment vertical component with restriction Mltdz is output as the desired floor reaction force moment vertical component for compliance control.

Please replace the paragraph beginning at **page 445, line 27**, and insert the following rewritten paragraph:

Another condition, in which an original request is changed in response to a change of a situation and the gait parameter changed as necessary to maintain a high stability allowance of a gait as described above is matched with or approximated to, as much as possible, a gait parameter that satisfies the changed

request, may be added to the restoring conditions. In this case, the aforementioned ~~aforementioned~~ restoring conditions 4, 5 and 6 should be deleted.